

Unity of command and the prosecution of the Joint Theater Missile Defense Battle

CSC 1997

Subject Area – Strategic Issues

EXECUTIVE SUMMARY

Title: Unity of command and the prosecution of the Joint Theater Missile Defense battle.

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Thesis: By incorporating theater missiles into Joint Pub 3.01, Doctrine for Countering Air and Missile Threats, the Joint Staff risks sub-summing the most potentially catastrophic strategic, operational and tactical threat poised against U.S. forces and the nation's regional interests.

Background: Since the Gulf War U.S. forces have made great progress in developing Joint Doctrine and weapon systems to counter theater missiles. Lessons learned from the Gulf War indicated that countering theater missiles under the deliberate, centrally controlled framework of theater air defense was not effective. This precipitated the publishing of Joint Pub 3.01-5 Joint Doctrine for Theater Missile Defense. This Joint Pub. legitimized theater missiles as a major threat to U.S. forces requiring unique and focused efforts to counter them. The Joint Staff is now in the process of incorporating both air and missiles under one doctrinal manual, in an effort to preserve the JFACC's unity of command over his/her battlespace. In so doing, theater missiles will potentially be placed into the category and framework that was deemed inadequate for the counter missile battle six years ago. Currently, the Army has made the most progress in integrating the operational elements of Joint Theater Missile Defense into a holistic system of doctrine and hardware, facilitating a responsive and decentralized framework to counter the unique aspects of the theater missile battle.

Recommendation: The best way to integrate the advances made by the Army in Joint Theater Missile Defense and facilitate the JFACC's unity of command is to establish the Army as the Joint Theater Missile Defense Coordinator. This coordinator would be the focal point of all Theater Missile Defense functions, integrating the unique capabilities of all services into a seamless theater wide architecture. In this way the JFACC could exercise unity of command without subsuming the most important threat and sub-optimizing the gains made by the Army in TMD operations.

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In 1990, U.S. Forces deployed to Saudi Arabia with the aspirations to first deter and, if deterrence failed, to defeat Iraqi Forces. Armed with world resolve and overwhelming force, the United States undertook its largest deployment since World War II. U.S. Forces arrived in Saudi Arabia, the proud product of the recently won Cold War; the Iraqi forces on the other hand, are modeled after their outfitter, the former Soviet Union. Iraq in the estimation of many military experts, matched up well with the United States; by mid January 1991, the approximate strength of the Iraqi forces included: “546,700 soldiers, 4,280 tanks, 2,880 armored personnel carriers and 3,100 artillery pieces.”¹ However, the Iraqi Army was unprecedented in its use of Tactical Ballistic Missiles (TBMs) equipped with chemical munitions during the Iran-Iraq War. The Iraqi willingness to launch TBMs, potentially equipped with chemical munitions, posed a serious dilemma for the United States and its coalition partners. In an effort to deter any Iraqi inclination to use such means, the United States made veiled threats and even insinuated a nuclear response to any use of chemical weapons. Additionally, the United States accelerated the previously planned fielding of the Patriot Air Defense Systems Anti-Tactical Ballistic Missile (ATBM) capability. Patriot units which deployed during Operations Desert Shield and Desert Storm (ODS), literally received their ATBM hardware, software and training upgrades days before deployments. In fact, crews had only limited experience in performing the Patriot system’s ATBM defensive mission. The success that Patriot enjoyed during the Gulf War was in large part due to the dedication and skills of the soldiers manning the system and the civilian defense industry personnel who trained and advised crews and commanders at all echelons. The ATBM capability was planned for in the early 70’s, developed during the fielding of PAC-1 and

fielded just in time to become a factor during the Gulf War. The Tactics, Techniques and Procedures were developed by the Air Defense School at Fort Bliss, Texas but there was no Joint Doctrine that included Ballistic Missiles in the threat set. Joint Pub 3.01-2, Joint Doctrine for Theater Counterair Operations (1 April 1986), provided the framework to successfully counter air breathing threats but failed to recognize the trend of future threats. As a consequence, Joint Pub 3.01-2 did not include a framework to successfully prosecuted the Theater Missile Defense (TMD) fight in the Gulf War.

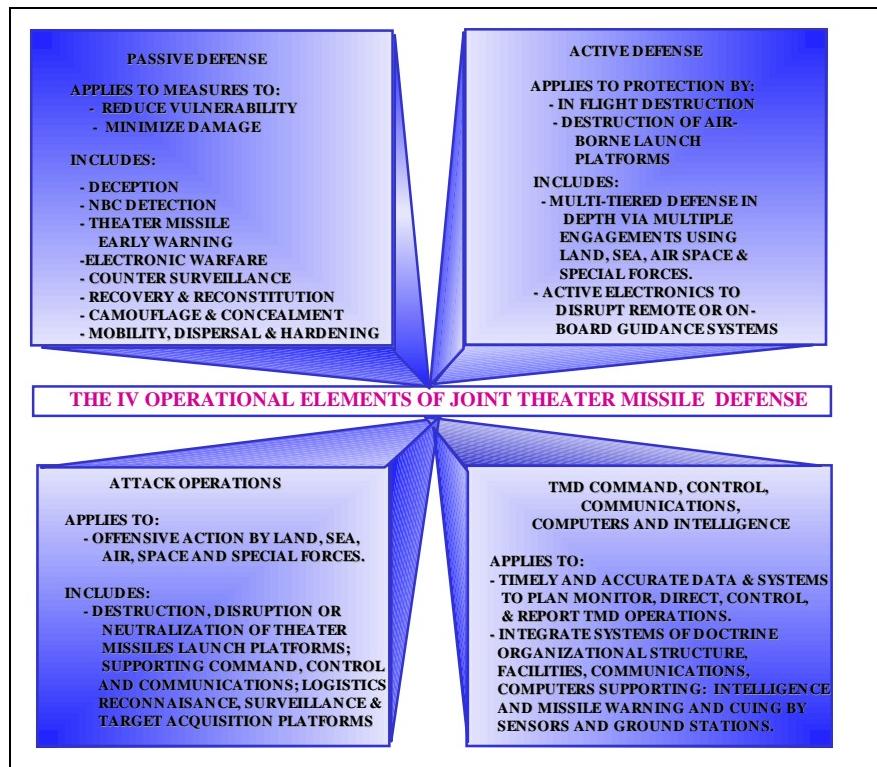


Figure 1. Operational Elements of TMD

The Gulf War accentuated the necessity for a doctrine base for TMD and as a result Joint Pub 3.01-5 Joint Theater Missile Defense (JTMD) was written. The JTMD document incorporated the four different elements required to prosecute the TMD battle. These four elements described in detail in figure 1 is a direct result of the lessons learned during the Gulf War. When, due to the emergence of Theater Missiles (TMs) as a major

military and political threat and the shortcomings of Joint Pub 3.01-2, TMD was accomplished in a disjointed manner.

Active defense was accomplished with the Patriot system, by modifying measures originally designed to counter manned aircraft. These modifications to defensive counterair measures allowed Patriot units to capitalize on their automatic classification capability and engage TBMs in the decentralized mode of operations. This mode of operations allowed higher headquarters to manage the missile battle by exception, a departure from the extremely centralized management used in manned aircraft defense. What was the reason for such a departure from the doctrinal norm? The TBM threat was so unique in its characteristics and speed that the command and control structure designed for anti-aircraft operations was deemed inadequate to support active defense against TBMs. Theater Missile Early Warning (Passive Defense) was accomplished through an ad hoc method of receiving national level intelligence and transmitting that information via voice communications through a number of stations to Israel, Saudi Arabia and Turkey. Attack operations were primarily assigned to offensive counterair strikes, “Scuds quickly became CENTCOM’s priority target and Horner redirected air sorties accordingly,”² and U.S. Army Special Forces detachments worked for the Joint Special Operations Task Force (JSOTF). Based on the numbers of sorties flown and the resulting zero Scud Tractor Erector Launcher (TEL) kills, offensive counterair operations were ineffective. Special Forces, on the other hand, enjoyed some success in destroying Scud TELs and were credited with eleven confirmed kills. Battle Management, Command, Control, Communications, Computers and Intelligence (BMC4I) was completely disjointed; reporting and information flow between commands within the

Area of Operations (AO) was extremely limited. For example, though the Patriot system could effectively communicate inter-battalion, it had difficulty communicating with other systems that could contribute to TMD capable systems. This BMC4I shortcoming not only had tactical implications but strategic as well. The Patriot units operating in Israel, Saudi Arabia and Turkey rarely shared TBM engagement data and After Action Reviews (AARs), resulting in inefficiencies in Patriot operations.

TMD was obviously in its infancy during the Gulf War, and prior to ODS few could have predicted the systems required to counter TMs. Due to this inexperience TMD in ODS lacked a coherent holistic approach resulting in a stove piped organization held together through a system of makeshift communications and liaison officers. Only through the dedication of U.S. service members and their civilian counterparts did the partitioned system work. The doctrine for JTMD, Joint Pub 3.01-5, is a direct result of the Gulf War experience. It was created as the defining document for TMD, creating a systematic framework from which the Joint Force Commander (JFC) can effectively and efficiently execute the TMD battle.

The Air Force, on the behest of the Joint Staff and passively influenced by the publication of the article, Unity of Command - Countering Aircraft and Missile Threats (JFQ, Spring 1996), is in the process of writing Joint Pub 3.01, Doctrine for Countering Air and Missile Threats (DRAFT). The intent of the authors of the Joint Pub was not to create an umbrella document which incorporates the distinct aspects of air and missile threats, but rather a document which would supersede 3.01-2 and 3.01-5 thus placing TMs and manned aircraft under the same category. Under the previous Joint Doctrine,

the Joint Staff recognized the unique aspects of both counterair and TMD by publishing two separate documents (See Figure 2). Under that doctrine the synergy of integrating

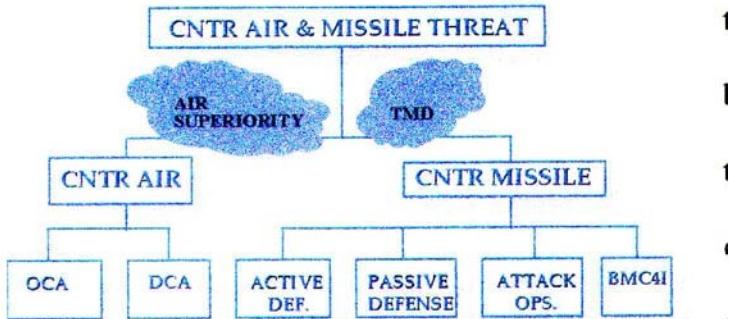


Figure 2. Post Desert Storm Doctrinal Construct

the four elements of TMD had been retained and also leveraged the “core competencies” of both counterair and counter missile operations. Under the new construct, Joint Pub 3-01 would reflect the integrating of TMD operations under the term counterair. By subsuming TBMs as part of the counterair threat, the Joint Staff minimizes TBMs as the

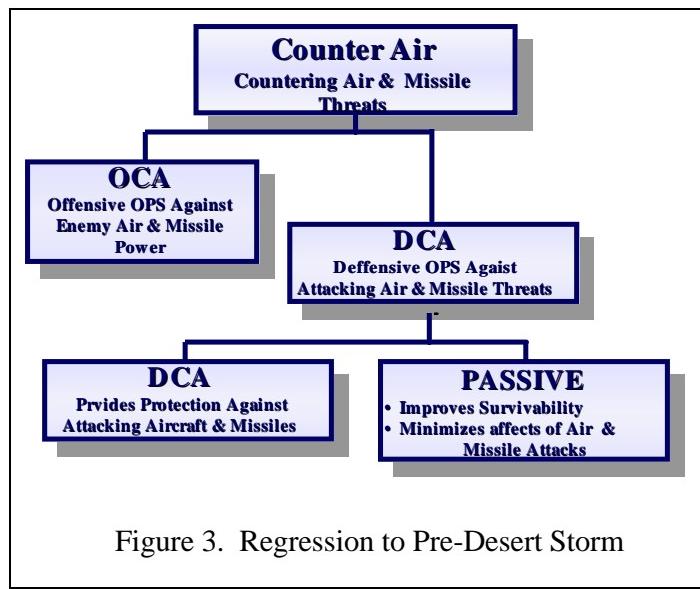


Figure 3. Regression to Pre-Desert Storm

most significant strategic, operational and tactical threat against United States’ interests and places manned aircraft as a co-equal to TBMs in terms of their potential impact. In so doing, the integration and synergy created in Joint Pub 3.01-5 is lost and its effects are

sub-optimized (See figure 3). By incorporating both threats under the Theater Air Defense framework the Joint Staff has essentially categorized TMs as just another target set.

<p>TBM STRESSING CHARACTERISTICS</p> <ul style="list-style-type: none"> • Varying Ranges: 30-3000 KM • Varying Trajectories • Varying Velocities: 500-400 M /S • Varying Employment Options <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Strategic, Operational, or Tactical <input checked="" type="checkbox"/> Terror Weapons • Warheads: Conventional & WMD • Covertly launched from highly mobile & easily concealed Launchers • Employs Various, Deliberate & Inadvertant Counter Measures: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Breakup / Multiple Warheads <input checked="" type="checkbox"/> Maneuvering <input checked="" type="checkbox"/> Decoy <input checked="" type="checkbox"/> ECM 	<p>CRUISE MISSILE STRESSING CHARACTERISTICS</p> <ul style="list-style-type: none"> • Difficult to Detect <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Low Altitude- Ground Clutter <input checked="" type="checkbox"/> Low Radar Cross Section Reduces Detection Range / Engagement Battle Space • Varying Battlespace: 30-3000 KM • Variety of Launch Platforms: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Sea, Land, Air <input checked="" type="checkbox"/> Mobile Launchers, Easily Concealed • Varying Employment Options: Strategic, Operational, Tactical • Warheads: Conventional & WMD • Accuracy: Against Tiped Targets or Manuvering Forces 	<p>UAV STRESSING CHARACTERISTICS</p> <ul style="list-style-type: none"> • Difficult to Detect <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Wide variety Construction Material Low Radar Cross Section <input checked="" type="checkbox"/> Ground Clutter <input checked="" type="checkbox"/> Can Enter AO from any Direction • Low to High Altitude Flight Profiles • Variety of Missiles: Collection Platform, ECM, Weapons Delivery Combinations • Variety of Launch Platforms: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Sea, Land, Air <input checked="" type="checkbox"/> Mobile Launchers, Easily Concealed
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Figure 4. TM Characteristics

TMs are defined in Joint Pub. 3.01-5 as; “ballistic missiles, cruise missiles and air-to surface missiles whose targets are within a given theater of operations.”³ The threat is sub-divided into three separate categories: TBM, Cruise Missiles (CMs) and Unmanned Aerial Vehicles (UAVs). Each have unique stressing characteristics with potentially catastrophic results. The proliferation of TBM technology from both China and, more significantly, North Korea in recent years has made the TM threat extremely diverse. Currently, “ballistic missiles have proliferated to 33 countries”⁴ In fact, relatively small nations such as Yemen have successfully used TMs in combat operations. The development of the No Dong missile (1,000 Km range) by North Korea has given the Pacific Region a new and significantly more complex threat. The Japanese

mainland is now within range of North Korean missiles, potentially equipped with Weapons of Mass Destruction (WMD). The diversity of the threat does not end with the number of nations which possess the capability, but it also includes the nature of the capability. TMs by their very nature, have unprecedented capabilities and create asymmetries for potential adversaries (See Figure 4). Joint Pub. 3.01-2 states that air superiority, accomplished through offensive and defensive counterair, concentrates on the neutralization of aerial vehicles, which by definition include, “enemy fixed wing aircraft, helicopters, Remotely Piloted Vehicles (RPVs) and cruise missiles.”⁵ This was the very same doctrine used and found too be ineffective for TMD during the Gulf War. The United States currently has the largest, most capable air forces in the world to counter manned aircraft. There is not an enemy manned aircraft threat that could survive where U.S. theater air and missile defense forces are deployed. Thus, an enemy manned aircraft threat could never have the impact of a TM under the same conditions. Susceptibility to TM attack is one of the United States’ strategic, operational and tactical critical vulnerabilities. Viewing TMs as just another air threat is a dangerous misinterpretation of their potential impact.

Joint Vision 2010 outlined the future objectives of the United States military, “...the primary task of the armed forces will remain to deter conflict--but, should deterrence fail, to fight and win our nations wars...to ensure we can accomplish these tasks, power projection, enabled by overseas presence, will remain the fundamental strategic concept of our future forces.”⁶ Projecting power requires a number of capabilities from strategic sea and airlift to force protection. More than any other weapon, TMs threaten each phase of joint force protection operations. Nations

provoking a U.S. led military response may not have the conventional means necessary to engage us on the battlefield and seek means other than decisive combat to deter our military actions; “an overmatched adversary is likely to avoid decisive combat, while attempting to secure economic, political and geographic objectives.”⁷ Early entry of U.S. Forces into an AO requires safe areas of lodgment and build-up from TMs. “In the future, successful attacks against ports or troops in lodgment areas have similar potential. Such attacks could prevent or unacceptably delay projection of our forces.”⁸ Commanders conducting early entry operations, with inherently high risk, must mitigate as much as possible the threat from long range weaponry. “The threat of theater missiles armed with weapons of mass destruction could successfully intimidate a friend or ally, forcing an unfavorable geopolitical decision detrimental to U.S. national interests.”⁹ The TM threat, however, will not be limited to possible strikes against western expeditionary forces. If unchecked missile proliferation continues, especially in the Middle East, close and even distant neighbors of rogue countries obtaining missiles may face the possibility of WMD strikes against their urban centers in the foreseeable future. The impact of WMD on civilians and political leaders can be understood by the tremendous strain Israel was under when its urban centers were under attack by Iraqi Scud missiles, potentially armed with chemical warheads. Actual chemical strikes against unprotected civilian centers will involve enormous causalities. Missile strikes involving nuclear or biological warheads could devastate civilian centers even following hasty civil defense measures. Deployment of the Carrier Battle Group will no longer suffice as a stand-alone Flexible Deterrent Option (FDO). Instead, threatened countries require visible signs of U.S. resolve with real TM defensive capabilities. Without capable FDOs, the effective

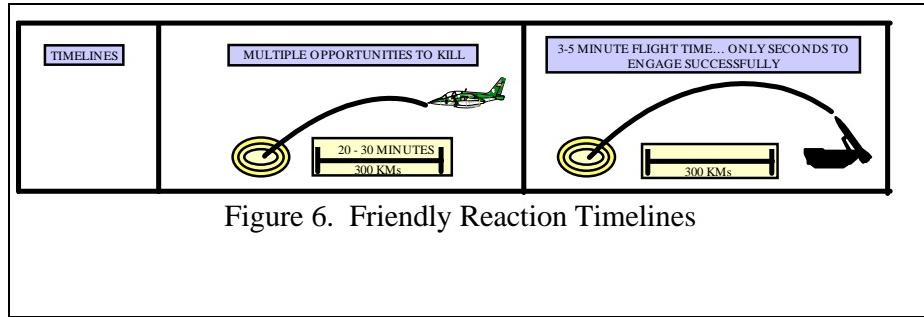
employment, or even the threat of employment, of TMs could preempt our ability project power. Events such as the Scud attack on Dhahran devastating the Pennsylvania National Guard Barracks accentuate the vulnerability any force has in relation to TMs. Add the Dhahran situation to events in Somalia, which caused the U.S. citizenry to express its intolerance to casualties, and we have the framework for enemy operations in the future. This is such an important issue that the Chairman addressed it again in Joint Vision 2010, "...the American people will expect to win in any engagement, but they will also expect us to be more efficient in protecting lives and resources while accomplishing the mission successfully."¹⁰ De-emphasizing the TM threat, as is the potential in Joint Pub. 3.01, is not in accordance with Joint Vision 2010 and risks losing the momentum gained from lessons learned in ODS.

The threat TMs pose has been discussed, but, the real question at hand is, why are Theater Air Defense and Theater Missile Defense different and what aspects are unique to each? In order to accomplish this, a comparison and contrast must be examined of potential enemies' economic abilities to purchase and maintain manned aircraft versus TMs and their potential "return on investment." By analyzing ODS lessons learned and deducing from a rudimentary Intelligence Preparation of the Battlespace (IPB), five common characteristics of both TMs and manned aircraft allow a comparison of the enemies' willingness to employ either attack platform. These characteristics are: enemy infrastructure demands, friendly reaction timeline to threat platforms, enemy opportunity to employ stealth technologies, enemy employment flexibility and investment in manpower and training.

REQUIRED INFRASTRUCTURE. In order for the enemy to mount a viable manned aircraft threat, significant investment must go into physical infrastructure. Aircraft require fixed assets such as runways and sophisticated maintenance facilities. Those static areas provide U.S. forces with easily identifiable targets, detectable through a simple map reconnaissance, or in extreme cases, the use of overhead imagery. Additionally, U.S. forces have a wide variety of means to defeat these assets, such as, the F-117, B-52s or TLAMs. The sophisticated nature of the infrastructure required to support manned aircraft make its “return on investment” potentially cost prohibitive to an emerging belligerent nation. On the other hand, TMs require less sophisticated maintenance facilities; maintenance could be accomplished in any vehicle repair facility with no distinguishing characteristics. In addition, TMs can be employed from unimproved launch sites, remotely located from any significant infrastructure. Such facilities require little investment and economically make better sense for an emerging nation than attempting to create a capable air force. Thus, for about \$50 million, a country could have 1 or 2 tactical fighter aircraft, up to 15 TBMs, or 100 off-the-shelf Cruise Missiles (CMs).

FRIENDLY REACTION TIMELINES. Provided that an enemy nation mounted a manned aircraft threat against U.S. forces, the timelines required to react to that threat are orders of different magnitude. Given a range of 300 km from detection to impact by either a payload from a manned aircraft or impact of the platform itself, the timelines are significantly different. An aircraft can transit a distance of 300km in 20-30 minutes. During its travel it will be detected by a number of sensors and, due to the duration of flight will be susceptible to multiple kill opportunities either by other aircraft

or surface to air missiles. Over the same 300 km distance, a TM's flight time is 3 to 5 minutes currently sensed only by space based assets. Once within range of surface base sensors, the opportunity to successfully engage a TM is measured in seconds with only one type of kill apparatus. Such operations require decentralized execution of the missile battle and can not be allocated and controlled centrally as has been done under the Counterair construct. Again, it is a matter of economics that TMs provide a greater impact for the invested dollar.



ENEMY OPPORTUNITIES TO EMPLOY THREAT TECHNOLOGIES.

Central to this characteristic is an enemy's ability to purchase stealth aircraft as opposed to its ability to purchase stealth materials and apply it to current technologies within the confines of its own border. The United States essentially controls the development and sale of aircraft to include aircraft stealth technologies. The possibility that third world or emerging countries could develop or purchase such capabilities is extremely rare and unlikely. On the other hand, unmanned threats provide a great opportunity for stealth technologies. The fact that components rather than entire platforms are being purchased allow a threat nation to clandestinely buy relatively small components and apply them in country to the technology on hand. Evidence of this was Iraq's ability to modify its Scud fleet making it a more difficult target to kill. The fact that these modifications caused a

secondary capability provided proliferating nations, such as China and North Korea, with the impetus of incorporating shaping, radar absorbing material, and signature reduction materials. Now, new TMs may be modified to fly faster over a longer distance and break apart, camouflaging the warhead by design rather than coincidence.

EMPLOYMENT FLEXIBILITY. Manned aircraft are inherently less flexible in their employment methods. They normally take off from a static airfield and after reaching their objective must return. The infrastructure does not move and consequently, provides for a very cooperative target. In other words, striking deep and killing the threat before it threatens is relatively easy, given our battlespace dominance. However, it is a much more difficult task to kill TMs on the ground. Provided the enemy has multiple types of TMs, the potential launch sites are many, draining assets in a effort to counter them. “By January 24 CENTCOM had diverted 40 percent of all sorties to Scud hunting at considerable cost to ARCENT’s efforts to prepare the battlefield.”¹¹ Their size and relative independent employment provide a great opportunity for deception, dispersement, camouflage, and concealment. These two factors, and the fact that finding the ground targets are extremely difficult, provide the enemy with a marked advantage. Going back to ODS, friendly sorties dedicated to killing SCUD launchers numbered in the thousands with no success. These efforts were against a one dimensional threat set, the Al Hussein missile with a range of 500-600 km. Launch sites were finite and clearly identified prior to the end of the missile war and still U.S. offensive counterair operations were unsuccessful. Potential enemy nations, in future conflicts, will seek to exploit this vulnerability.

INVESTMENT OF MANPOWER AND TRAINING. Building a viable air force requires a significant investment. In order to properly train and maintain pilots, years of initial training is required (usually facilitated by the United States). Additionally, the only way to capitalize on this initial investment is to maintain pilot proficiency through training programs and flight training hours. In either case, significant capital is spent training, maintaining and sustaining the air force. In addition to the physical infrastructure, hundreds of support personnel are needed to maintain relatively few pilots. An example is the United States Air Force or the Carrier Battle Group. Consequently, manned aircraft are inherently cooperative threats, very expensive to purchase, train, maintain and sustain, and dominated by U.S. manned air force capabilities.

TMs require very little manpower. Each SCUD launcher has a crew of no more than five personnel. The fact that they can be independently employed and sustained from remote locations makes the support infrastructure streamlined and inexpensive. The amount of capital needed to establish and maintain a tactical missile force is low. Crews can be trained in a matter of weeks, the tasks are simple when compared to the tasks required by pilots, sustainment training is cheap based on equipment needed and materials required to facilitate the training. The fact that TMs are relatively cheap and inherently flexible give threat nations the impetus to use them.

The question is, given the analysis above, will an emerging nation attempt to build an air force to challenge the United States? The answer is no. In fact, just the presence of U.S. air forces provides a deterrent to both the employment and establishment of any potential enemy air force. U.S. Forces are not vulnerable to manned

aircraft now or in the foreseeable future. Consequently, this requires potential adversarial nations to look elsewhere in order to expose our critical weaknesses. The adversaries that can exploit our critical vulnerabilities are those nations that pose the greatest threat. That vulnerability lies in our ability to project the force and at the same time protect it. For this reason, the most “bang for the buck” lies in TMs. “Ballistic missiles - and increasingly, cruise missiles - are viewed as a means to defeat the sophisticated defense of more advanced countries such as Israel or South Korea. Ballistic missiles are fast, immune to pilot error, pose limited logistical and manpower requirements, can be based on sovereign territory, and as yet are largely invulnerable to current means of defense. The last factor renders missiles an excellent means of demoralizing an enemy, as was demonstrated during the Iran - Iraq “war of the cities.” In addition, their range allows states with otherwise limited power projection capabilities to exert regional or global influence.”¹²

CONCLUSION

There can be no doubt that the impact of TMs in the future battle will be felt at every level of war. TMs launched from any distance – 75 Km or 1,000 Km – with ever increasing accuracy exposes one of our nation’s critical vulnerabilities. The potential devastation these weapons create combined with their bargain basement cost (when compared to manned aircraft) make it the impact weapon of the 21st Century. After ODS, the Joint Staff recognized the unique role TMs played and will play in the future and tasked the Army to write Joint Pub. 3.01-5, Doctrine for Joint Theater Missile Defense. The publication identified all the integral parts required to prosecute the missile battle under the JFC. It recognized that effective TMD, “requires a coordinating

authority, who has the support of a trained, dedicated staff, equipped with an automated command and control capability.”¹³ To accomplish this, the Chief of Staff of the Army tasked the United States Army Space and Strategic Defense Command to build and initially man a facility which could integrate and synchronize the operational elements of JTMD. Currently, this group of eleven HUMMMVs is the enabling system for the establishment of the U.S. Army Air and Missile Defense Command, the only facility which follows and implements the tenets of Joint Pub. 3.01-5 and integrates the elements of TMD for the JFC.

In the Spring 1996 issue of Joint Forces Quarterly, Air Force Major Vinnie DiFronzo postulated that current doctrine does not facilitate a unity of command in counterair and counter missile operations. Consequently, he suggested that the JFACC control both counterair and counter missile operations. Efficiencies in operations would result by managing fratricide and apportioning airspace, functions normally associated with the speed and numbers of manned aircraft and not missile defense. Unity of command is an essential element of any successful operation, but unity of command should not be established by assuming away a threat capability. In order to maintain unity of command of the JFACCs battlespace and emphasize the importance of the TM threat, a compromise to Joint Pub. 3.02 and the role TMD should be established.

The current doctrine for JTMD was written in response to the needs of the nation. Joint Pub. 3.01-2 was written and approved in 1986. This was prior to the Iran - Iraq war (1988) in which Scuds were used at will. Additionally, from 1989 to 1991, the Afghan Government used approximately 1,500 Scuds to attack the Mujahideen. At no time did the creators of the Counterair framework make necessary changes to incorporate the new

long range threat of choice. Operations under Joint Pub. 3.01-2 during the Gulf War did not efficiently or effectively prosecute the missile battle. For example, 2,460 sorties were flown to counter the Iraqi Scud TELs, yet not a single kill was confirmed. Joint Pub. 3.01-5 addressed those inadequacies and attempted to clarify TMD operations. However, the focus of the JFACC remains on manned aircraft operations. Its communications infrastructure, battle management methods and doctrine all focus on weapons other than TMs; “JFACC deconflicted 3,000 sorties per day during the Gulf War while monitoring and controlling 160 restricted operations zones, 122 airborne refueling points, 32 CAP areas, 10 transit routes, 60 Patriot engagement zones, 312 missile engagement zones, 60 restricted fire areas, and 17 air base zones.”¹⁴ The JFACC is currently overwhelmed with the number and size of an air operation on the scale of ODS; however, to allow separate air battles and missile battles to occur in the same battlespace under separate commanders is illogical. For this reason, the JFACC needs to capitalize on the doctrine for JTMD and the material and TTP developed from it. The best way to accomplish this and reduce the work load of the JFACC is currently dealing with, is to establish a JTMD Coordinator who works directly for the JFACC and coordinates all elements of TMD within the JOA. In this way the JFACC could exercise unity of command without subsuming the most important threat and sub-optimizing the gains made by the Army in TMD operations.

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⁸ LTG Edward G. Anderson III, "Space and Missile Defense: A Global Challenge," *Army Magazine*, December 1996, 16

⁹ Ibid, 16

¹⁰¹⁰ Chairman of the Joint Chiefs of Staff. *Joint Vision 2010*. Joint Staff, Washington, D.C., 1997, 6

¹¹ BG Robert H. Scales, Jr., *Certain Victory, United States Army in the Gulf War*. Office to the Chief of Staff, Army, Washington, D.C., 1993, 184.

¹² LTG William E. Odom, USA (Ret), *The Emerging Ballistic Missile Threat to the United States*. Report of the Proliferation Study Team, Washington, D.C., February 1993, 5

¹³ LTG Jay M. Garner, "Advancing the Army's Theater Missile Defense Capabilities," *The Army Green Book*, 1996-97, Arlington, VA, October 1996, 169.

¹⁴ Major Vincent DiFronzo, "Unity of Command-Countering Aircraft and Missile Threats," *Joint Forces Quarterly*, Spring 1996, 34.